

5 CLAIMS:

1. An arithmetic unit for multiplying a first quantity X by a second quantity Y, said arithmetic unit comprising:

10 a Booth coder having a plurality of inputs for receiving a plurality bits of the second quantity and a plurality of outputs for providing Booth coded outputs; and

15 circuitry connected to at least one of said inputs and said outputs for modifying at least one output of the coder, wherein said unit is capable of performing the calculations X multiplied by Y and -X multiplied by Y, the output of the Booth coder being the same for both of said calculations.

20 2. A unit as claimed in claim 1, wherein the Booth Coder comprises three inputs.

3. A unit as claimed in claim 1, wherein the Booth coder provides three outputs.

25 4. A unit as claimed in claim 1 wherein said circuitry comprises a logic gate.

5. A unit as claimed in claim 4, wherein said logic gate is an exclusive OR gate.

30 6. A unit as claimed in claim 1, wherein said coder is arranged to provide a CX output, a C2X output and a SGN output.

7. A unit as claimed in claim 6, wherein said SGN output is connected to said circuitry.

35 8. A unit as claimed in claim 1, wherein said circuitry comprises at least one multiplexer.

40 9. A unit as claimed in claim 1, wherein said coder is arranged to provide a SNGL output, a NZP output and a NZN output.

CODED - 9546 FEB 69

5 10. A unit, as claimed in claim 9, wherein said NZP and said NZN
outputs are connected to said circuitry.

11. A unit as claimed in claim 10, wherein said NZP output is connected to a first and a second multiplexer and said NZP output is also connected to said first and second multiplexers.

12. A unit as claimed in claim 11, wherein a partial product is to be output, the first multiplexer provides the NZP output and the second multiplexer provides the NZN output and when the partial product of the opposite sign is to be generated, the first multiplexer provides the NZN output and the second multiplexer provides the NZP output.

13. A unit as claimed in claim 1, wherein said second quantity
20 is a xN bit operand where x is an integer and N bits are used for
multiplication with the first quantity, $xN/2$ Booth coders are
provided and said circuitry is connected to inputs or outputs of
said $xN/2$ Booth coders.

25 14. A unit as claimed in claim 13, wherein x is equal to two and the N most significant bits or the N least significant bits are used in said multiplication and said circuitry receives at least one control signal to control the selection of the N bits.

15. A unit as claimed in claim 12, wherein x is equal to two and the N most significant bits or the N least significant bits are used in said multiplication and said circuitry receives at least one control signal to control the selection of the N bits. three multiplexers are provided, the first and second multiplexers each receive the NZP and NZN outputs of first and second Booth coders and the third multiplexer receives the SNGL outputs of first and second Booth coders.

16. A unit as claimed in claim 1, wherein said circuitry is
40 connected to at least two of said inputs.

10

10

15

20

25

30

30

35